Austin Energy's
Strategies and Technologies for Advancing EE/RE

Fred Blood
Sustainability Officer
City of Austin

Air Innovations
Chicago 2005

Generating Sources

- 3 gas fired plants 1830 MW (60%)
- 1 coal-fired plant 600 MW (19%)
- 1 nuclear plant 400 MW (13%)
- Purchasing 182 MW from wind
- Purchasing 13 MW from landfill methane
- Purchasing 1 MW of Hydro

Austin Energy Strategic Plan December 2003

- 20% Renewables by 2020
  - 100 MW Solar by 2020
- 15% Energy Efficiency by 2020

Energy Resource Priorities
10 Year Generation Plan

- Cost Effective Energy Efficiency
- Cost Effective Dispatchable Renewable Energy
- Natural Gas
- Nuclear
- Clean Coal (not short range)

AE Excels in:

- Demand-side Management
- Green Power Sales
- Green Building
- Distributed Generation

2005 Commercial Energy Efficiency Programs

- Existing Construction lighting retro-fits
- Water heater cycle program
- Energy Misers program
- LEDs
- Municipal buildings
- Power partner
- Load Co-op
- Thermal Energy Storage

2005 Residential Energy Efficiency Programs

- Whole House rebates
- Duct sealing rebates
- Home audit
- Clothes washer rebates
- Multi-family rebates
- Multi-family duct sealing
- Power Partner
- Refrigerator recycle program
- Free weatherization

MUNICIPAL ENERGY CONSERVATION PROGRAM

Traffic Signal Conversion to LED

Goal: 5,500 traffic signals

Existing incandescent lamps 135 watts

New LED lamps 11 - 15 watts

Energy savings per lamp 120 watts

= 90% Energy Reduction

9.5 megawatts, 2.5 year payback... (3% COA total energy consumption)

GREEN BUILDING PROGRAMS

Single- and Multi-Family Residential

- Over **4,500** single-family homes rated
- Over **5,000** multi-family units rated
- GBP rating required for **all** affordable housing
- ***Green by Design***
  workshop for homeowners held 4 times per year

GREEN BUILDING PROGRAMS

Single-Family Residential

FY 2004-2005 Results

- 760 homes rated (23**%+** of all new homes in AE service area)
- **1,064 MWH and $84K** energy savings for customers

GREEN BUILDING PROGRAMS

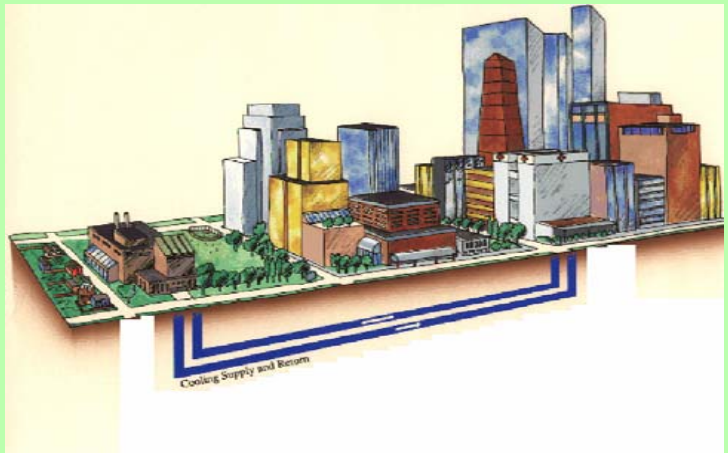
Total Green Building Program Savings

24,010 MWH and

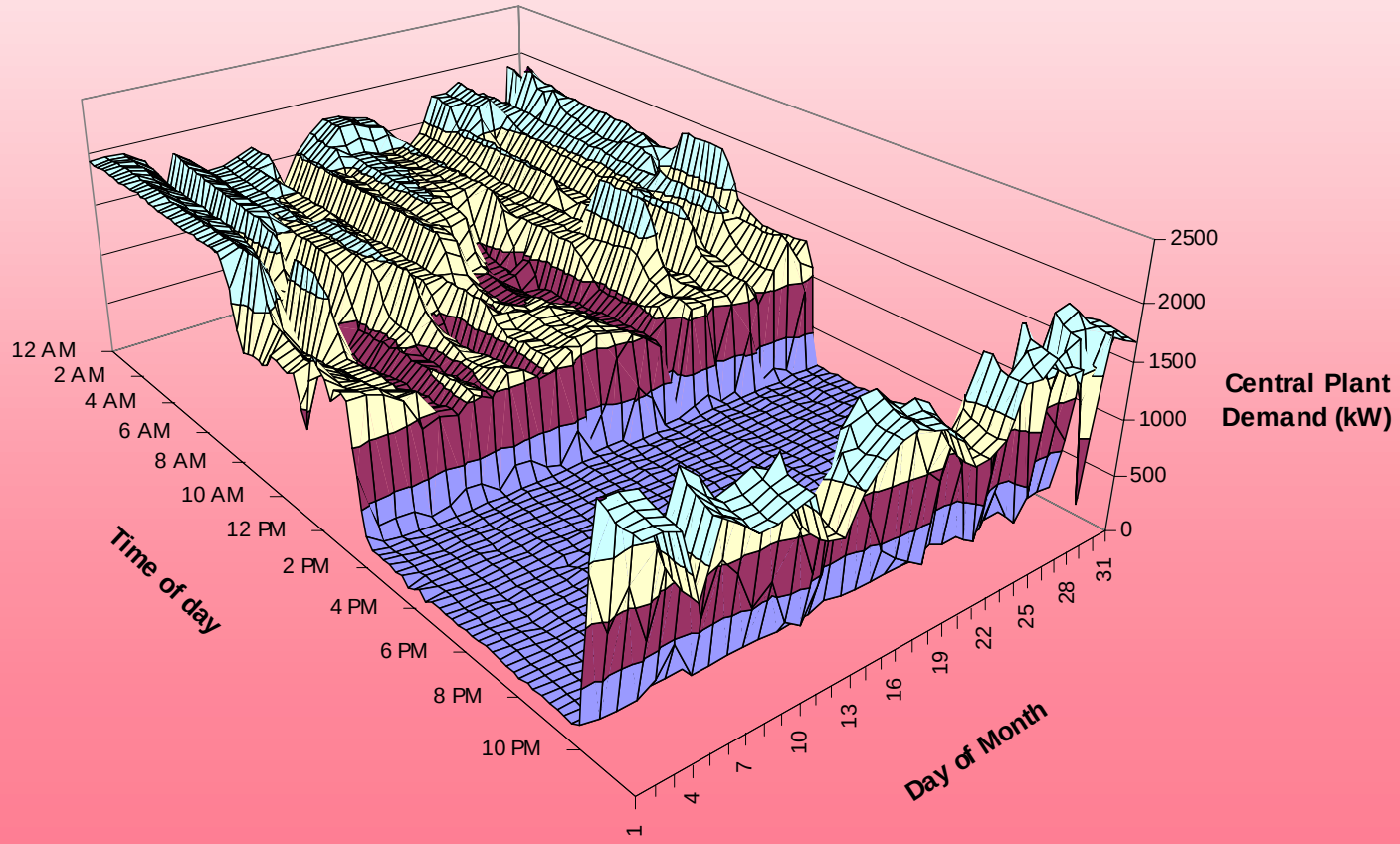
$1.18 Million energy savings for customers

District Cooling

- Downtown and Airport District Cooling Systems with Thermal Storage Systems
- Campus or Development Based Central Chilled Water Systems
  - Thermal storage shifts large loads from peak
- Aggregation of loads enables superior efficiencies, reliability, and quality when compared to stand-alone cooling systems



Austin-Bergstrom International Airport Central Plant Demand Profile for July 1999



EE saves money for AE

- The conservation is actually saving energy and is verified through four separate methods.
  - AE has avoided the cost of building a 500 MW plant due to conservation programs

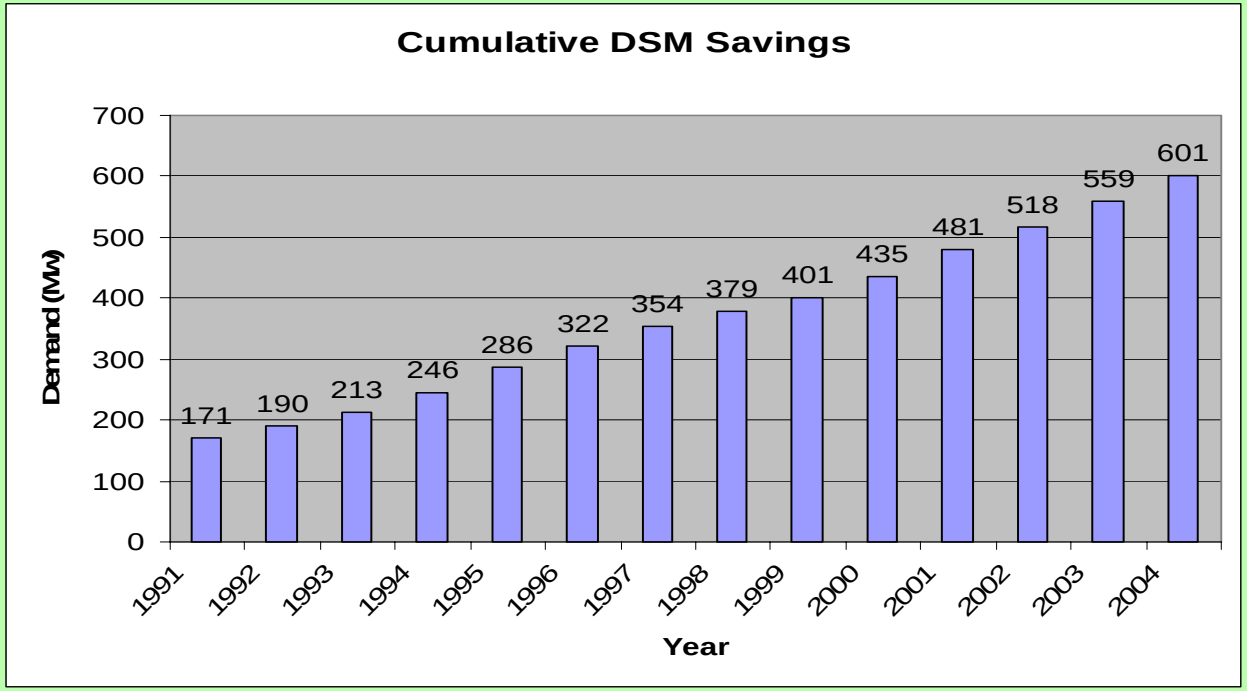
- Full program costs are included in the cost/benefit analysis and benefits accrue to both the customer and the utility.

COMMERCIAL EFFICIENCY PROGRAM
Economic Conservation Programs
FY 2004- Financial Incentives - Cost per KW

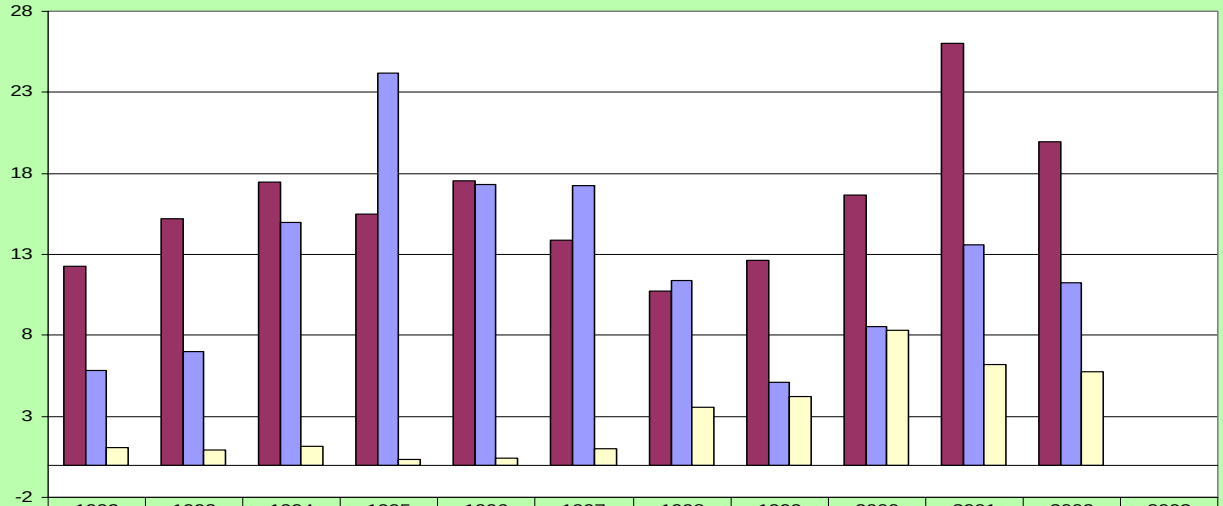
Program Name	Incentives Paid	Operating Costs	Grants/ Revenues Received	Net Costs	KW Savings	$/KW Saved
Conservation Rebates	$ 1,285,248	$ 507,047	$ 101,234	$ 1,691,061	4,682	$ 361
Small Business	$ 305,652	$ 157,793	-----	$ 463,445	1,126	$ 412
Vending Mizer Program	$ 347,394	$ 42,855	$ 281,978	$ 108,271	362	$ 299
Inter-Local Agreements	$ -	$ 2,345,479	$ 1,640,962	$ 704,517	2,534	$ 278
Eng. Technical Support	-----	$ 43,237	-----	$ 43,237	1,037	$ 42
Total	**$ 1,938,294**	**$ 3,096,411**	**$ 2,024,174**	**$ 3,010,531**	**9,741**	**$ 309**

Notes:

1. Technologies include lighting, air conditioning, motors, insulation and reflective roof coatings.
2. Lighting discount program targeting small commercial customers with <100kW demand.
3. Give-away program for devices that control refrigerated vending machines.



Annual MW Savings for Conservation Programs



	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Residential	12.26	15.16	17.47	15.51	17.51	13.86	10.71	12.66	16.65	26.04	19.92	0
Commercial	5.83	6.97	14.99	24.21	17.32	17.28	11.4	5.09	8.56	13.55	11.241	0
Green Builders	1.05	0.92	1.15	0.32	0.38	0.97	3.58	4.2	8.31	6.23	5.75	0

Years

Energy Efficiency Programs
Environmental Benefits

FY 2004 Emission Savings:

68,071 Megawatt/hours

- Sulfur Dioxide 8.3 Tons
- **Nitrogen Oxides 41.9 Tons**
- **Carbon Dioxide 43,411 Tons**
- Carbon Monoxide 54.6 Tons
- Total Supend. Part. 10.8 Tons
- Mercury 1.2 Pounds

New Money in FY 2005 for Conservation & Solar!

- $ 2,500,000 Solar Programs
- $ 92,000 Residential E-Star loans
- $ 441,000 Refrigerator Recycling
- $ 810,000 Multi-family Duct Sealing
- $1,431,000 Residential Power Partner

New Money in FY 2005 for Conservation & Solar!

- $ 548,000 Commercial Existing Construction Rebates
- $ 192,000 Small Business
- $ 263,000 Commercial Power Partner
- $ 1,171,000 Conservation Administration

Distributed Generation in Austin

- Co-generation
- Combustion turbine & absorption chiller
- Solar Photovoltaics
- Experimental Fuel Cells
  - Power, heat and hot water at assisted living facility
  - 5 kW residential fuel cell

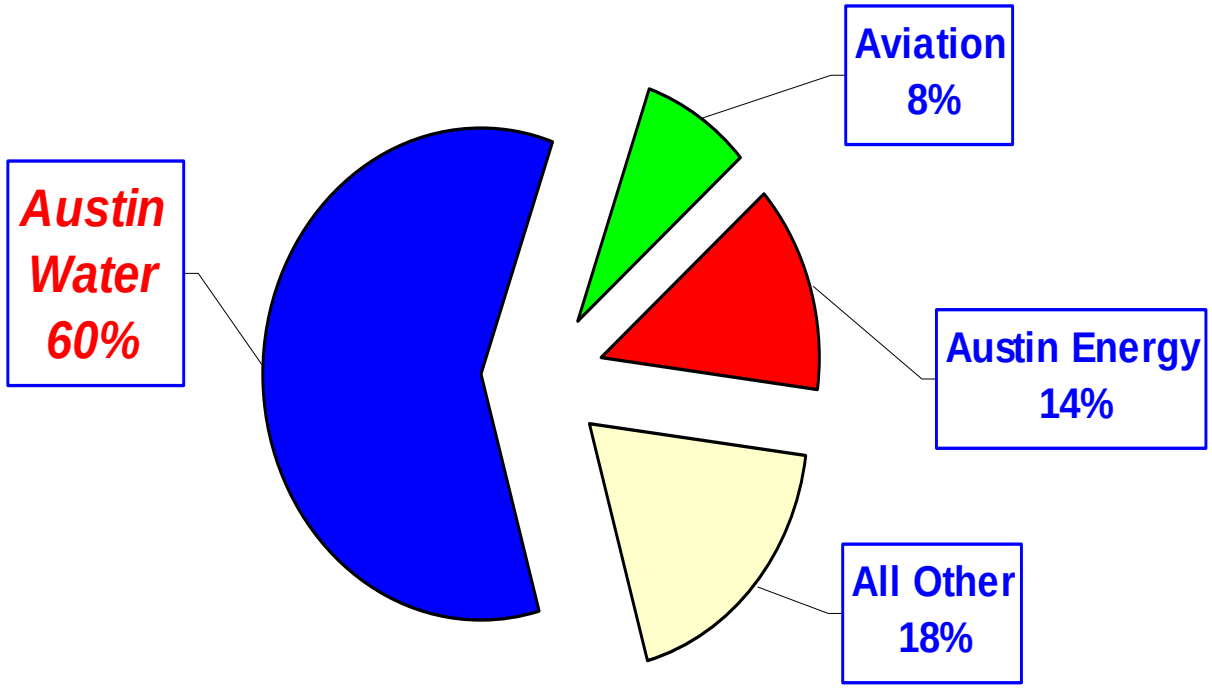
GreenChoice STATUS

- GreenChoice launched mid-Jan 2000
- Began billing April 2001
- As of December 2004
  - Over 7300 residential customers enrolled
  - 54 large commercial subscribers
  - 254 small businesses
  - 383,468 MWh annual subscription commitments

HOW GreenChoice WORKS

- All Austin Energy customers are eligible;
- Subscribers pay a fixed GreenChoice charge, **locked in for 10 years**, in place of an adjustable fuel charge;
- GreenChoice charge = 3.3 cents/kWh,
  - Current fuel charge is 2.8 cents/kWh
- Commercial customers receive recognition proportional to level of participation

Electric Energy Use by City Department for Austin



GREEN GARDEN INITIATIVE
Xeriscaping

Use Austin-hardy native and adapted plants because they:

- Require little water
- Reduce the need for pesticides
- Attract wildlife

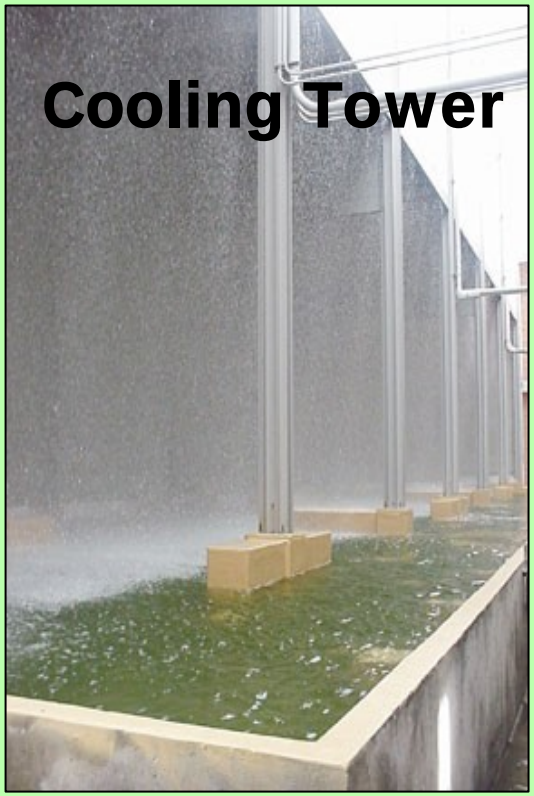
WATER CONSERVATION
Commercial Programs

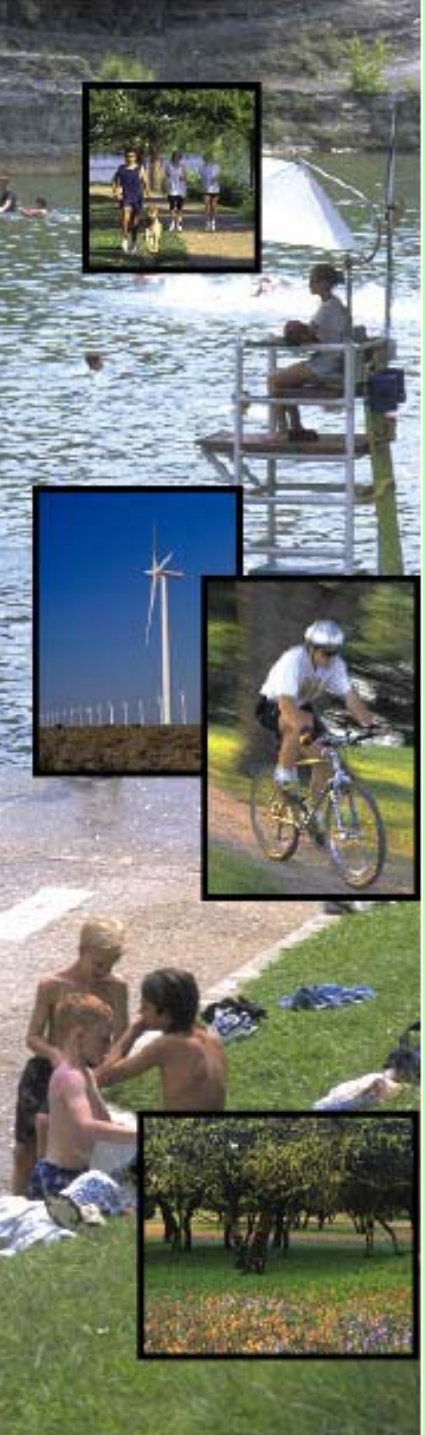
- Dental and Medical Dry Vacuum
- Excellence in Water Conservation Award
- Irrigation Audit
- Rainwater Harvesting
- Toilet Replacement
- WashWise Program
- Special Commercial Rebates
- Whole System Water Conservation

WATER RECLAMATION
City Initiatives

Re-use of high quality, non-potable water from Walnut Creek Wastewater Treatment Plant

Golf Course Irrigation



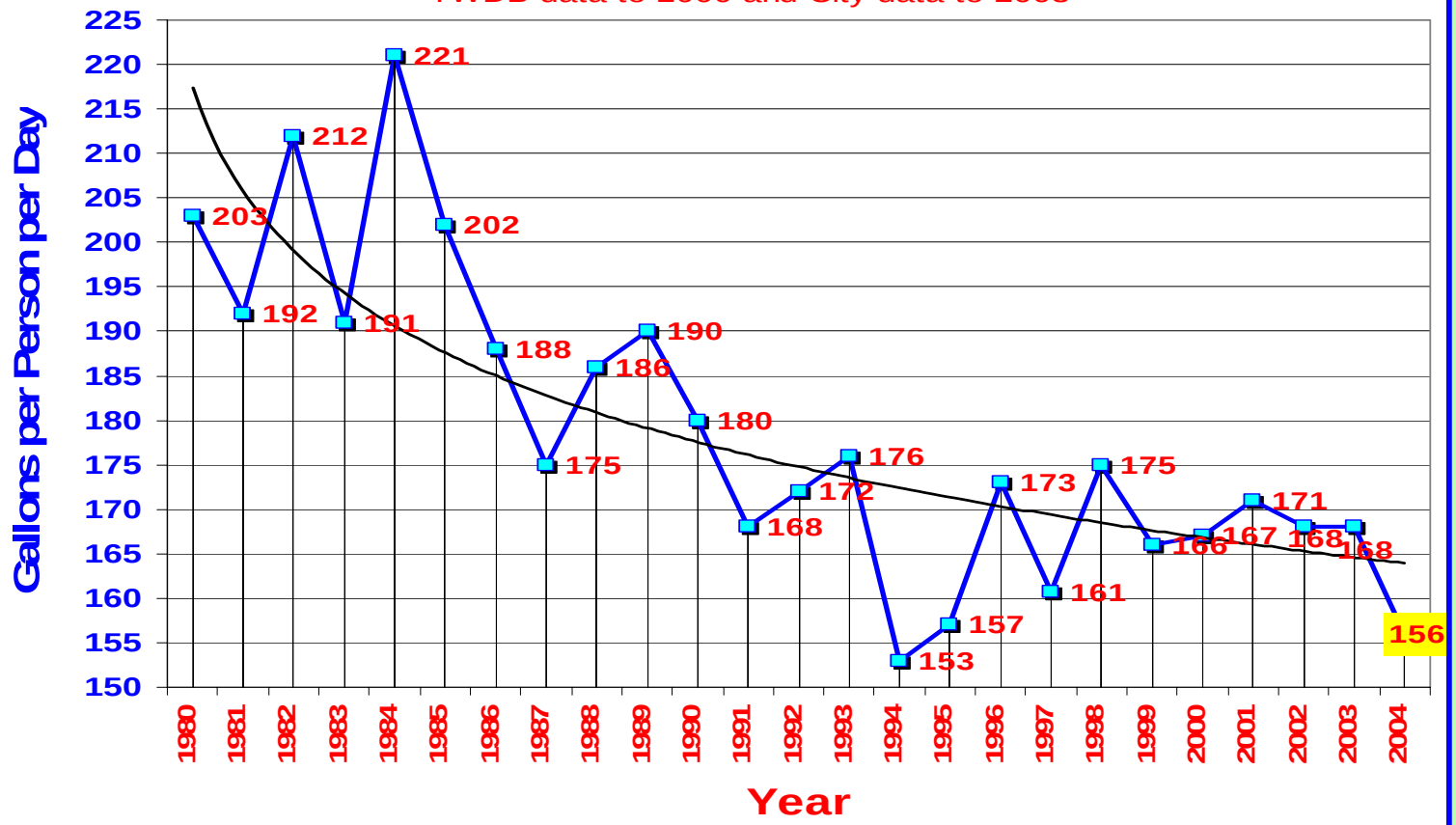



Car Wash
$1 BILL CHANGER
ONLY IN TEXAS!

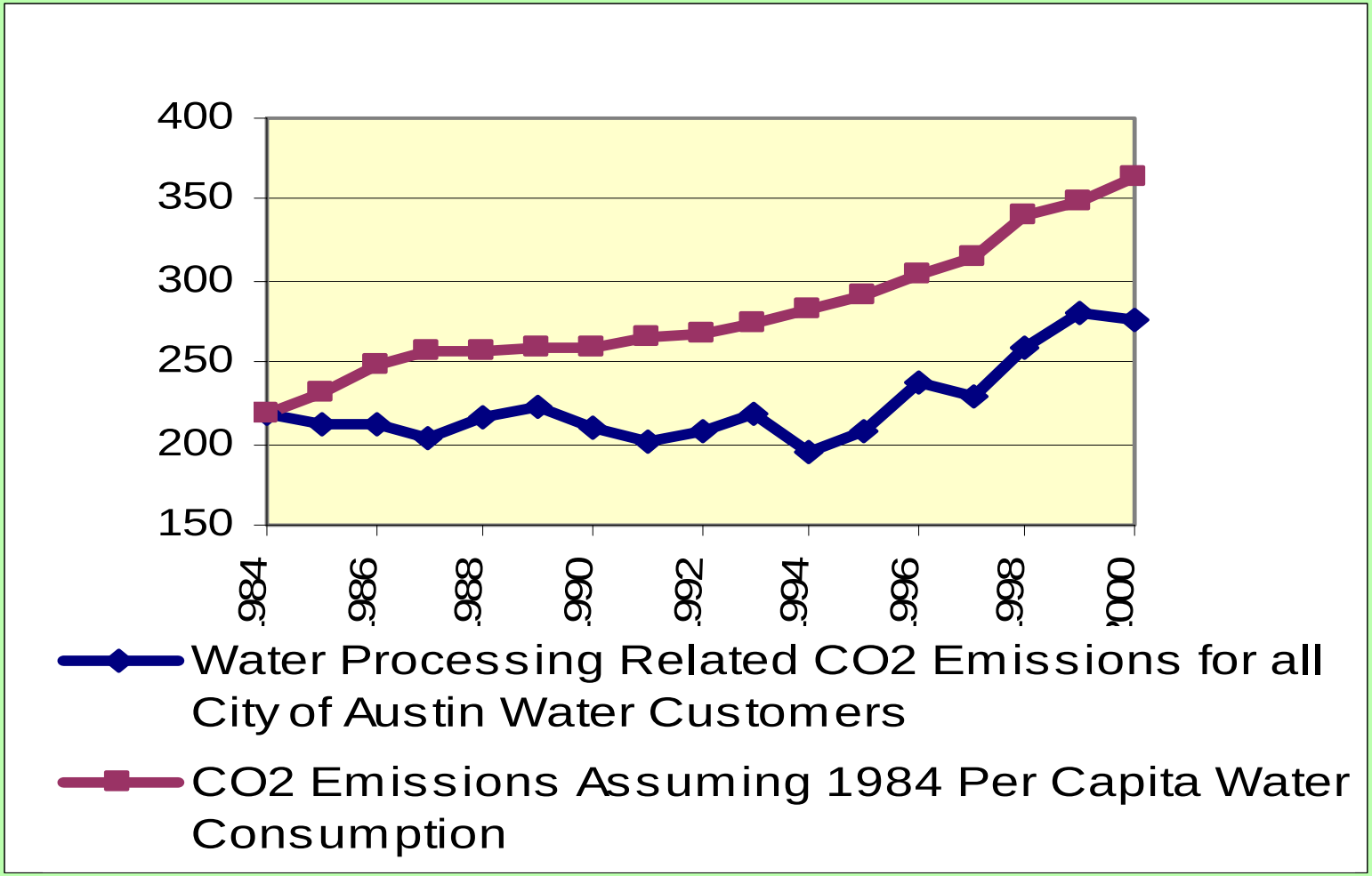
Non- Industrial Per Capita Water Use in Austin

1980 - 2004

TWDB data to 2000 and City data to 2003



CO_2 Emissions With and Without Water Conservation



Resolution Adopted by Austin City Council on July 29, 2004

" . . . that the City Manager is directed

to investigate the feasibility of the future

integration of the electric and transportation

sectors, and its impact on Austin Energy."

The Perfect Storm

- Economics – cheap oil is running out
- Environmental – pressure to curb pollutants from transportation
- National Security – pressure to curb dependence on oil


Regular 233 9/10
Plus ARM 9/10
Premium LEG 9/10
Gasoline

Alternatives to Petroleum

- Energy Efficiency
- Alternative Fuels
- Hydrogen
- Electricity

Electricity Advantages

- Cost
- Infrastructure
- Multiple Fuels
- Emissions
- Renewable Energy

Plug-In Hybrids

- Plug-in hybrid vehicles are electric-drive hybrid vehicles with an all electric operating range. They combine batteries and internal combustion engines in an efficient manner.
- Plug-in hybrids can be fueled through an electric wall outlet or at the gas station.
- They are more gas-efficient than hybrids.